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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,500	07/27/2006	Takaaki Noda	128807	6657

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EXAMINER	
STOUFFER, KELLY M	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
10/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,500	NODA ET AL.	
	Examiner	Art Unit	
	KELLY STOUFFER	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Due to amendments, the objections of the previous office action and the 35 USC 112 rejections of the claims are withdrawn. The lack of Unity requirement is maintained for reasons argued before and was made final in the previous office action. Applicant's arguments filed 23 June 2008 regarding the prior art rejections have been fully considered but they are not persuasive. The applicant argues that the pressure changes as claimed in claim 1 are not routine experimentation. However, the purges in Kim et al. are used to purge unreacted material (abstract) and the purges of Hatano et al. are used to remove residue from the chamber in between substrate processings (abstract). Different residue would take different pressures to remove and hence the pressure in each purge relies on reaction conditions. Therefore, each of theses purging pressures, purging times, and amount of times the furnace is purged, and hence their relative values, may be modified by routine experimentation in order to achieve their desired results as described in the references, absent evidence to show the criticality of the claimed values/relative ranges. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220 F.2d 454, 105 USPQ 223 (CCPA 1955).

The applicant further argues that Kim in view of Hatano does not teach that the exhaust valve is open during evacuation and closed during inert gas supply for the purging step.

New grounds of rejection appear below for newly added claim 18.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US 2003/0232514 A1) in view of Hatano et al. (US 5963834).

As to claims 1-5, Kim et al. discloses manufacturing a semiconductor device comprising loading and processing a substrate in a reaction furnace or chamber with a series of inert gas purges, and unloading the substrate when the process is complete and repeated a sufficient number of times (abstract). Kim et al. does not disclose purging in between removing the substrate and substituting another. Hatano et al. teaches using an inert gas purge during a dry clean operation without the substrate in the chamber in order to purge the chamber of residue from the process (abstract). Therefore, it is obvious to one of ordinary skill in the art to include purging the chamber after the substrate is removed in Kim et al. as taught by Hatano et al. in order to remove residue from the chamber in between processing substrates. Though neither reference explicitly teaches the pressure requirements of claim 1, the purges in Kim et al. are used to purge unreacted material (abstract) and the purges of Hatano et al. are used to remove residue from the chamber in between substrate processings (abstract). Therefore, each of theses purging pressures, purging times, and amount of times the

furnace is purged, and hence their relative values, may be modified by routine experimentation in order to achieve their desired results, absent evidence to show the criticality of the claimed values/relative ranges. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220 F.2d 454, 105 USPQ 223 (CCPA 1955).

As to claims 7-8, the process of Hatano et al. has removed the substrate from the substrate support during the purging operation (abstract). It is noted by the examiner that using a dummy wafer in order to protect sensitive elements on the substrate holder during cleaning is a very common technique in the art.

As to claims 9-11, Kim et al. teaches a boron doped silicon film with the claimed precursors in paragraph 0026.

As to claim 12, Hatano et al. teaches the cleaning and purging process after the removal of every wafer in the abstract.

As to claims 13-16 and 18, Kim et al. in view of Hatano et al. teach the elements of these claims as discussed above. In addition, both Kim et al. and Hatano et al. are under vacuum conditions, so it follows that when the chambers are evacuated, the passageway to the vacuum pump is open. Further, it is noted that it is extremely common in the vapor deposition/vacuum chamber arts to have valves attached to vacuum pumps for cleaning and the entrance of gases into the chamber to prevent damage to the pump machinery and vacuum chamber itself, and that closing at least one of these valves on a mechanical pump, etc. would be well within the capabilities of

one of ordinary skill in the art. The valve would especially be closed to a sensitive pump during heating and purging as in Hatano at the bottom of column 4 to the top of column 5.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KELLY STOUFFER whose telephone number is (571)272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
Art Unit 1792

kms

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792